AMENDMENTS TO THE DRAWINGS:

The attached six replacement sheets of the drawings are enclosed. The Office Action was not clear as to the specific objections to the drawings. The Office Action did note that the shading of the computer screen as well as the shading of Figure 6, should be corrected. In an effort to make a complete response to the Office Action, Applicant has corrected the drawings according to Applicant's understanding of the objections and to improve the clarity of various drawings. Applicant has also changed the layout and has reduced the number of sheets. If the drawings are not acceptable, Applicant invites the Examiner to telephone the undersigned to discuss any deficiencies.

Attachment: Replacement Sheets

Annotated Sheets Showing Changes

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REMARKS

Status Of Application

Claims 1-20 are pending in the application; the status of the claims is as follows:

Claims 7-12 are withdrawn from consideration and have been cancelled without prejudice to assert in a continuation application.

Claims 1, 4-6, 13-17, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,070,125 to Murphy ("Murphy") in view of U.S. Patent No. 6,151,555 to Van Bemmel ("Van Bemmel").

Claims 2, 3, 18, and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,070,125 to Murphy ("Murphy") in view of U.S. Patent No. 6,151,555 to Van Bemmel ("Van Bemmel") and further in view of screen shots of ESRI.com captured via the WayBackMachine ("ESRI").

Claim Amendments

Claims 7-12 have been cancelled without prejudice to assert in a continuation application. Claims 1-6 and 13-20 are represented.

35 U.S.C. § 103(a) Rejection

The rejection of claims 1, 4-6, 13-17, and 20 under 35 U.S.C. § 103(a) as being obvious in view of U.S. Patent No. 6,070,125 to Murphy ("Murphy") in view of U.S. Patent No. 6,151,555 to Van Bemmel ("Van Bemmel"), is respectfully traversed based on the following.

A first step in the evaluation of obviousness is to understand the invention. Three of the most intensive data processing operations are the modeling of nuclear reactions, weather forecasting, and the analysis of seismic data. The generation of seismic data requires the set up of geophones or hydrophones, the initiation of a sound wave, and the recording of reflected waves from the formations. The collection of seismic data is time intensive and extremely expensive. Those who collect seismic data for resale take steps to protect the data in order to recover the cost of collecting and storing the data. The prior method for providing seismic data to prospective purchasers was inefficient and costly. In essence, the potential purchaser selected an area and the data owner processed the data relating to the area into seismic maps for review by the potential purchaser. The data owner invested substantial time in the preparation of the data for review with no assurance the potential buyer would purchase the data. Upon purchase, the buyer was typically supplied with the seismic data. Thereafter, the purchaser could process an analysis of the data in a manner selected by the buyer. (See paragraph 5-8). The present invention relates to a method and system to increase the availability of seismic data to potential purchasers, in a manner which preserves the data collector's interest in the data while increasing the ability of a potential purchaser to view many potential areas of interest in a short time frame.

In one embodiment of the present invention, rather than generate a detailed seismic map for a specific area for presentation to a potential buyer, first the full seismic data for various areas is made into an image file which is compressed to a predetermined size. In one embodiment, the compressed data is rasterized so that the compressed seismic data can be viewed on CRT or computer monitor. This can be thought of as preparing a summary or abstract of the full seismic data for the chosen areas. In a preferred embodiment, the compressed data can be viewed by a potential purchaser and if there is a particular area of interest as a result of reviewing the image from the compressed data, a cross reference is provided to the full seismic data information. (See paragraphs 9 and 10). Further, image files of the compressed data can be provided for a large area and linked to a map or series of maps of varying levels of detail. For example, a map of the U.S. can be

displayed which allows selection of a particular state, and subsequent selection of a particular state, a particular county, and further subdivisions can follow. (See paragraph 15 and 18). This allows the data owner to prepare a collection of images of abstracted seismic data (compressed files) that can be viewed by one or more potential buyers. The buyer can view the compressed image files for multiple areas of interest and select to purchase the full data for any area(s) desired. (See paragraph 19). The full seismic data file is then provided to the purchaser who can conduct the extensive processing needed to determine the three-dimensional geologic structure underlying the surface seismic data. (See paragraph 28).

A second step in the evaluation of obviousness is to understand the scope and content of the art. Murphy relates to a system for modeling geological subsurface areas. The system is designed to assist geologists construct, modify and test various potential models for a formation. (Col. 1, ll. 21-27). Such modeling is rife with difficulties such as the available data may be limited, and the data may not directly correlate to the desired characteristic to be modeled. (Col. 1, ll. 32-41). As a result, such modeling requires a great deal of "interpretation" based on the judgment of experienced geoscientists. (Col. 1, ll. 43-49). The system allows the scientist to use all the available data, just not seismic data, to systematically evaluate proposed alternative models of the underground formation. (Col. 3, ll. 9-16). The goal of Murphy is to develop a model of the compartment in which oil or gas may reside. (Col. 4, l. 54- Col. 5, l. 6). This is done in part by providing a decision tree hierarchy of the various types of data having branches for different possibilities. (Col. 3, ll. 47- 57). The process can also include a validation to compare the selected model for the compartment against the seismic data. (Col. 9, l. 63- Col. 10, l. 2). Thus, Murphy is a method that would be applied by a purchaser of the full seismic data from a vendor of the current invention in order to model the formation.

The Office Action asserts that Murphy "...does disclose a drill down capability whereby files are linked and thereby compressed in order to provide more detailed geographic information ...". Applicant upon careful review of Murphy can find no

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support for such an assertion and requests that specific references to the portions of Murphy relied upon be provided so that Applicant may respond appropriately. The disclosure of Murphy is contrary to the conclusion of the Office Action. Murphy explains the problem is that "...subsurface formations are typically either sparsely sampled or sampled at a low resolution by measurements made in a borehole or by surface geophysical measurements". (Col. 1, ll. 33-36). Murphy's purpose is to use as much information as possible to construct a model of the underground compartments. This information includes geophysical, geographical, known geological structures, etc. (Col. 3, ll. 25-29). Information in addition to seismic data is used because as Murphy states:

> Seismic measurements often do not have the resolution to
> delineate the compartments; wellbores frequently are very
> few and far between. (Col. 4, ll. 63-64).

It is not logical that Murphy after teaching that seismic data is lacking in resolution, suggests using even less precise seismic data which has been compressed in order to model a compartment. Additionally, Murphy validates the compartment model developed with the seismic data, and it is illogical to think that validation would be done by using less precise compressed seismic data.

Van Bemmel discloses a seismic signal processing method for generating a cube of variance values. The Office Action contends that Van Bemmel et al. "teaches a method of compressing each of said plurality of graphic image files to create a plurality of corresponding compressed data files." Applicant finds no support for such a conclusion from the cited portions of Van Bemmel et al. What Van Bemmel teaches is a method for analysis of the full seismic data.

> In three dimensional (3-D) seismic, the principle is the same
> except that the arrays of geophones and hydrophones are
> more closely spaced to provide more detailed subsurface
> coverage. As a result, extremely large volumes of digital
> seismic data are received by a computer and stored therein,
> the computer processing the seismic data and executing
> certain software stored in the computer and displaying the

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> results of that processing. Following that processing, final
> interpretation of the processed seismic data can be made.
>
> The processing of the digital seismic data requires
> computer resources which store and execute complex
> software for enhancing the received digital data/seismic
> signals and for muting accompanying noise which masks the
> signals. Once the digital data/seismic signals are processed,
> the resultant processed signals are recorded and displayed in
> the form of a "cube" and plurality of maps which represent
> slices through the cube, such as horizontal time slice maps
> or horizon maps, which display various geologic features
> situated on the corresponding slice of the through the cube.
> (Col. 1, ll. 43-62) (Emphasis added)

Thus, Van Bemmel is a program related to an improved method of processing of the seismic data for interpretation. Van Bemmel does not process the file by compressing the file. Rather, Van Bemmel processes the data to enhance the value of the data by masking noise. Van Bemmel creates from the enhanced data, multiple images of the same formation along different slices.

The next step in the consideration of obviousness is to evaluate the differences between the invention and the art and determine whether those differences would have been obvious to one of ordinary skill in the art at the time of the invention.

The differences between the invention and the references are many and include the following. None of the references disclose multiple map display each having a plurality of seismic data lines based on a plurality of compressed seismic data files. None of the references disclose a plurality of geophysical displays generated upon selection of a corresponding surface data line. None of the references disclose references to full seismic data files corresponding to the compressed seismic data files.

Murphy is concerned with incorporating many different types of data to supplement full seismic data to model a formation compartment. There is no suggestion to produce a collection of compressed seismic files. Van Bemmel is concerned with a

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method to image the full seismic file and with providing multiple views of the same seismic data along different time slices for improved interpretation. There is no suggestion in Van Bemmel to put together a collection of compressed files. Neither reference contains any suggestion to provide a list of references relating the full seismic file to the compressed file. Thus, claim 1 is not obvious.

Claims 4 and 5 are not obvious for the same reason as claim 1 and further because none of the references teach embedding references in the geophysical display, or electronically associating the references with the compressed seismic data.

Claim 6 is not obvious for the same reasons as claim 1 and in addition, neither reference would suggest lossy compression. In lossy compression, the full data can not be recovered from the compressed file. Neither of the references disclose compression of the seismic data. Both references are directed at improved tools for interpretation of the data. Thus, neither reference would suggest to someone skilled in the art to compress the data in a manner in which the full data could not be recovered.

Claim 13 specifies creating a plurality of image files from full seismic data files in a vector format into an image format, followed by the compression of the image files to create a plurality of compressed seismic data files; a reference is provided linking each compressed data file with the corresponding full seismic data file; the selection of a data line causes the image corresponding compressed data file be displayed; and storing the compressed files, references and map on a medium.

None of the references disclose making a compressed image file as discussed above. Van Bemmel discloses making an improved image file from the vector file which allows the image to be viewed in slices to aid in interpretation. However, neither Murphy nor Van Bemmel teach or suggest compressing the image file made from the vector file. As discussed above, none of the references disclose linking the compressed image file to a data line or to a reference to the full seismic data file. Thus, claim 13 is not obvious.

Claim 14 is not obvious for the same reasons as claim 13 discussed above. In addition, it requires the repeated compression of the file until the compressed seismic data file is within a predetermined size. Neither of the references suggests or teaches the repeated compression of a file to obtain a predetermined size. Thus, for this reason as well, claim 14 is not obvious.

Claim 16 is not obvious for the same reasons as claim 13 discussed above.

Claim 17 is not obvious for the same reasons as claim 13 and in addition, neither reference would suggest lossy compression. In lossy compression, the full data can not be recovered from the compressed file. Neither of the references disclose compression of the seismic data. Both references are directed at improved tools for interpretation of the data. Thus, neither reference would suggest to someone skilled in the art to compress the data in a manner in which the full data could not be recovered

The rejection of claims 2, 3, 18, and 19 are rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 6,070,125 to Murphy ("Murphy") in view of U.S. Patent No. 6,151,555 to Van Bemmel ("Van Bemmel") and further in view of screen shots of ESRI.com captured via WayBackMachine ("ESRI"), is respectfully traversed based on the following.

The claims are not obvious from a combination of the Murphy and Van Bemmel references as discussed above and the discussion with not be repeated. ESRI is cited to show use of various computer media, and thus ESRI adds nothing to suggest the modification of Murphy and Van Bemmel except to use different media.

Claims 2 and 3 are not obvious for the same reasons as claim 1.

Claims 18 and 19 are not obvious for the reasons as discussed above with respect to claim 13.

Accordingly, it is respectfully requested that the rejection of claims 2, 3, 18, and 19 as obvious over Murphy, Van Bemmel, or Murphy, Van Bemmel, and ESRI be reconsidered and withdrawn.

CONCLUSION

Wherefore, in view of the foregoing amendments and remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

This Amendment does not increase the number of independent claims, does not increase the total number of claims, and does not present any multiple dependency claims. Accordingly, no fee based on the number or type of claims is currently due. However, if a fee, other than the issue fee, is due, please charge this fee to Hitchcock Evert LLP's Deposit Account No. 503374.

Any fee required by this document other than the issue fee, and not submitted herewith should be charged to Hitchcock Evert LLP's Deposit Account No. 503374. Any refund should be credited to the same account.
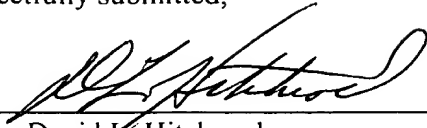
If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

Any other fee required for such Petition for Extension of Time and any other fee required by this document pursuant to 37 C.F.R. §§ 1.16 and 1.17, other than the issue fee, and not submitted herewith should be charged to Hitchcock Evert LLP's Deposit Account No. 503374. Any refund should be credited to the same account.

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Application No. 09/893,070
Amendment dated June 3, 2005
Reply to Office Action of March 24, 2005

Respectfully submitted,

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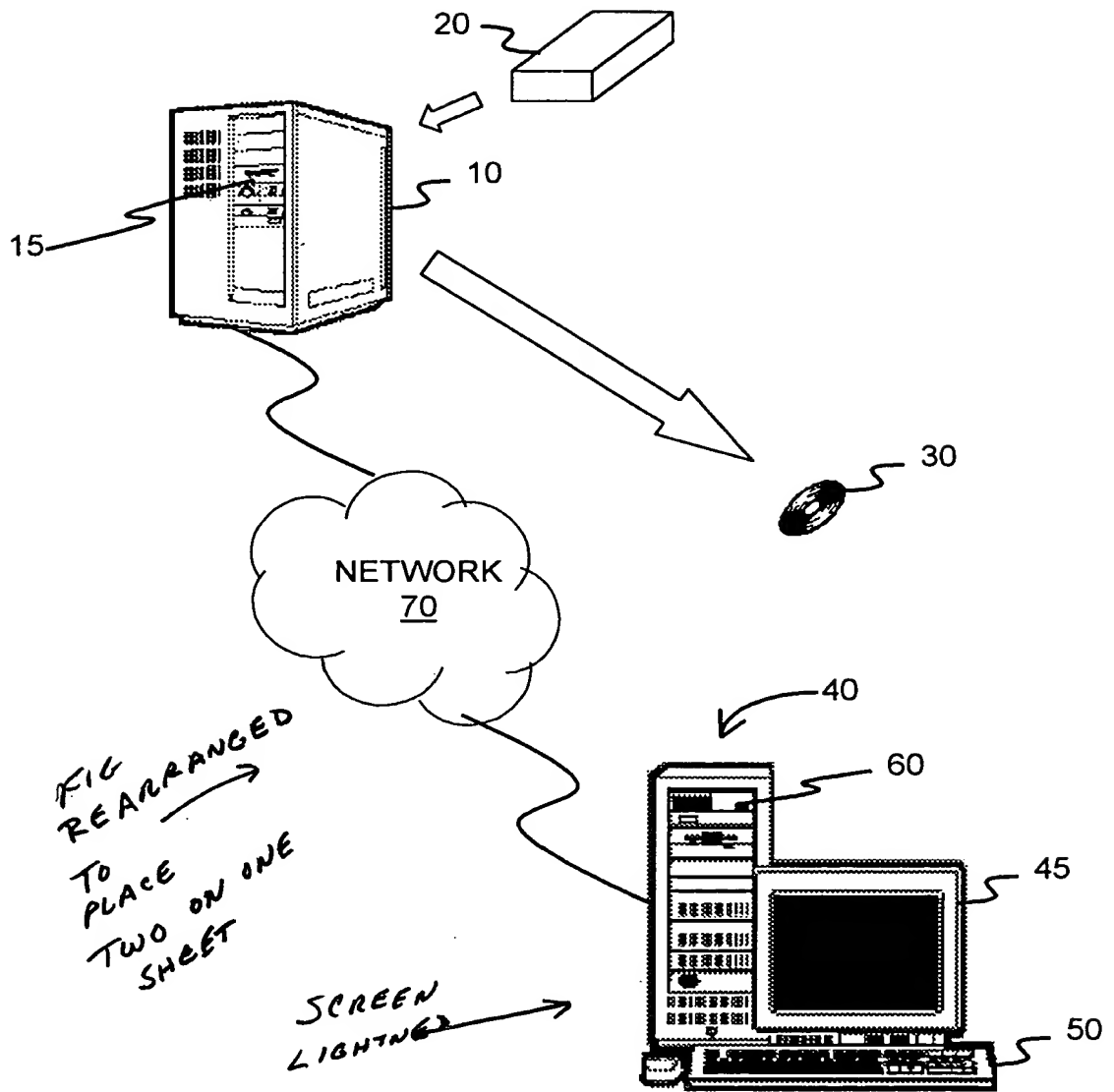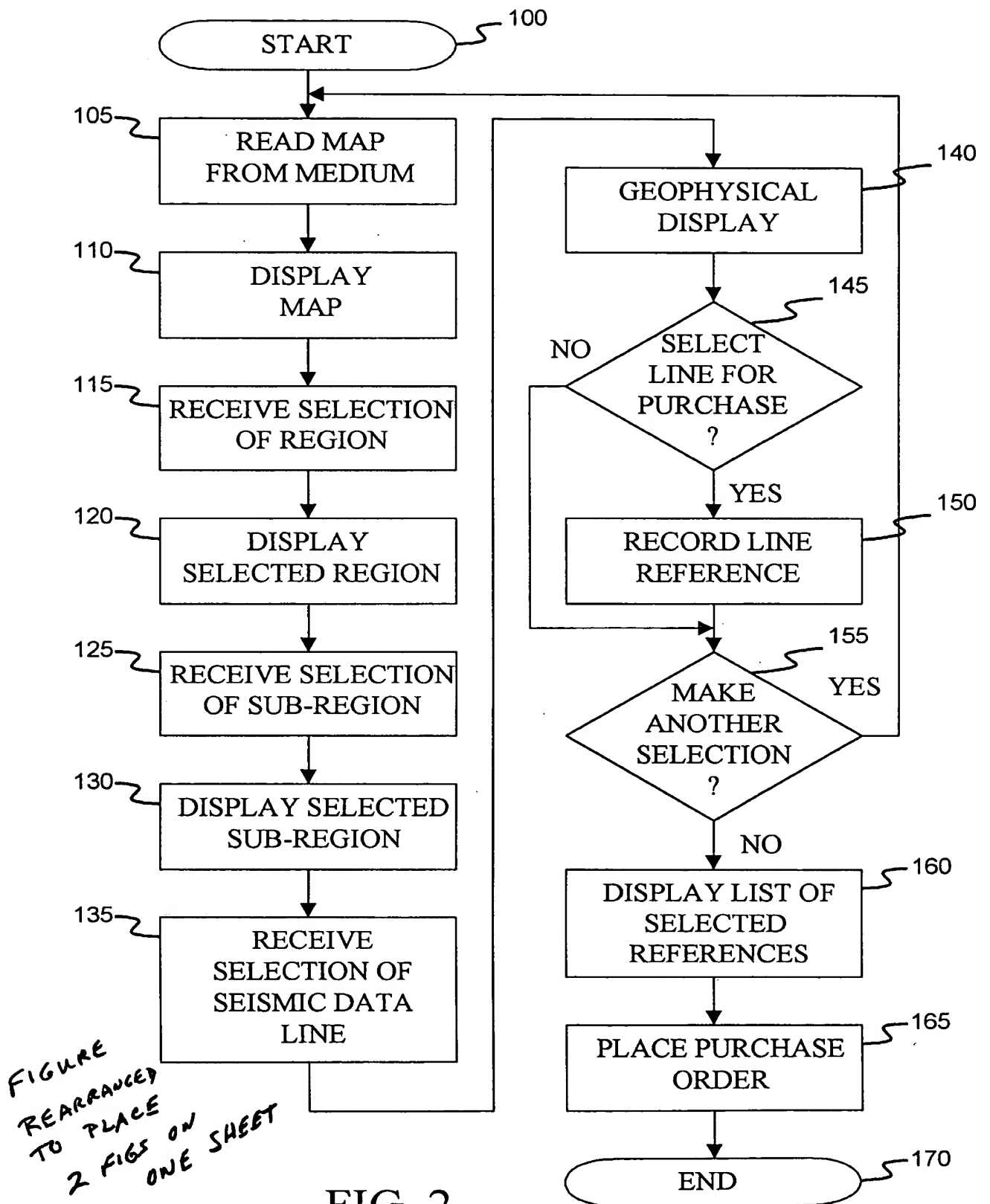Facsimile: (214) 953-1121
June 3, 2005

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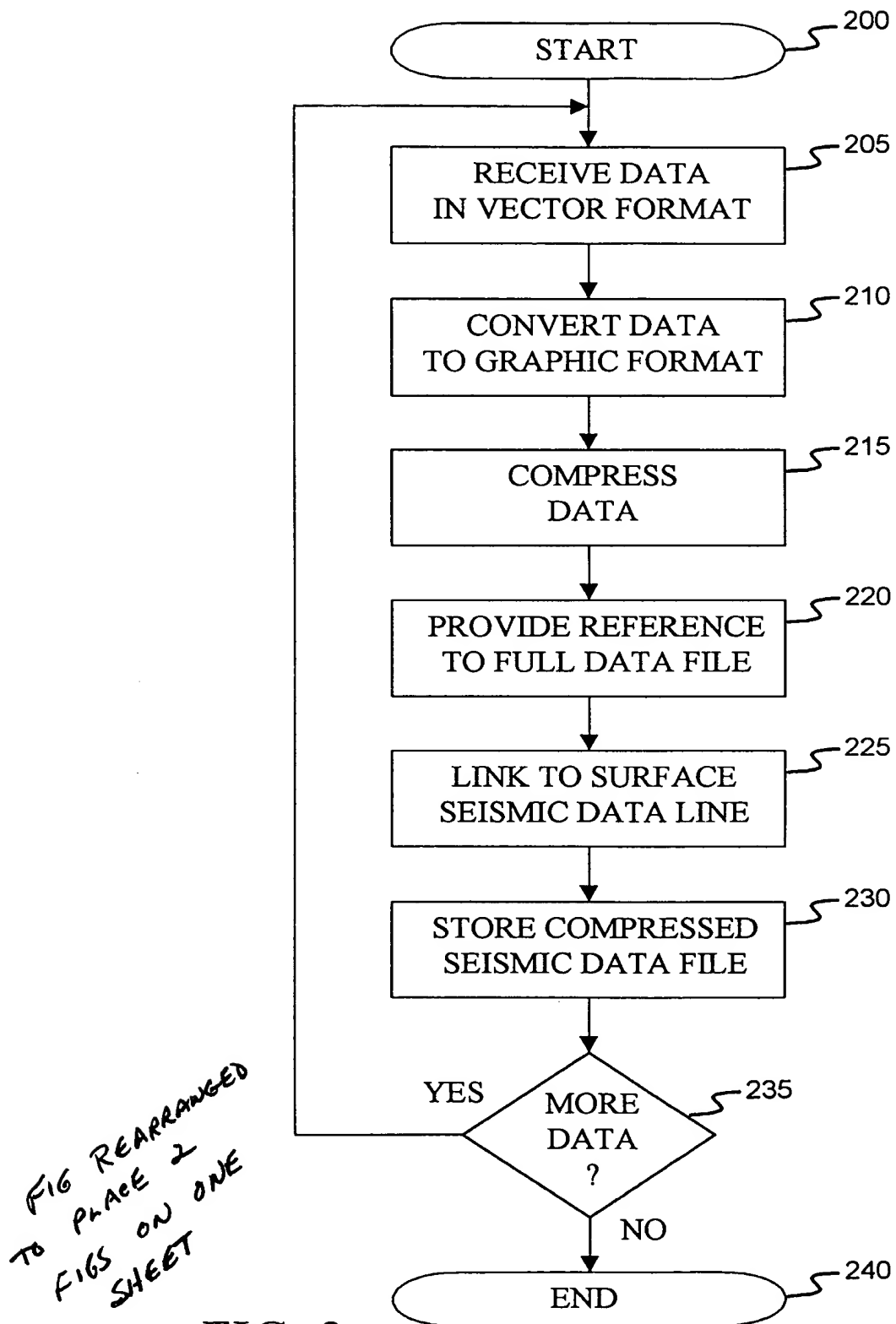
FIG. 1

START — 100

105 — READ MAP
FROM MEDIUM

110 — DISPLAY
MAP

115 — RECEIVE SELECTION
OF REGION

120 — DISPLAY
SELECTED REGION

125 — RECEIVE SELECTION
OF SUB-REGION

130 — DISPLAY SELECTED
SUB-REGION

135 — RECEIVE
SELECTION OF
SEISMIC DATA
LINE

GEOPHYSICAL
DISPLAY — 140

SELECT
LINE FOR
PURCHASE
? — 145
NO

YES

RECORD LINE
REFERENCE — 150

MAKE
ANOTHER
SELECTION
? — 155
YES

NO

DISPLAY LIST OF
SELECTED
REFERENCES — 160

PLACE PURCHASE
ORDER — 165

END — 170

FIGURE REARRANGED TO PLACE 2 FIGS ON ONE SHEET

FIG. 2

START ⟋ 200

RECEIVE DATA
IN VECTOR FORMAT ⟋ 205

CONVERT DATA
TO GRAPHIC FORMAT ⟋ 210

COMPRESS
DATA ⟋ 215

PROVIDE REFERENCE
TO FULL DATA FILE ⟋ 220

LINK TO SURFACE
SEISMIC DATA LINE ⟋ 225

STORE COMPRESSED
SEISMIC DATA FILE ⟋ 230

YES   MORE
DATA
? ⟋ 235

NO

END ⟋ 240

FIG REARRANGED
TO PLACE 2
FIGS ON ONE
SHEET

FIG. 3

Name	Size	Type
Index.htm	1KB	Micro...
logo.gif	8KB	GIF I...
⋮		
USA-Map.htm	1KB	Micro...
usa-color.jpg	53KB	JPEG ...
⋮		
OK.htm	8KB	Micro...
Okquads_A.jpg	1,133KB	JPEG ...
⋮		
tangier.htm	1KB	Micro...
tangier.jpg	247KB	JPEG ...
⋮		
239.jpg	402KB	JPEG ...
240.jpg	394KB	JPEG ...
⋮		

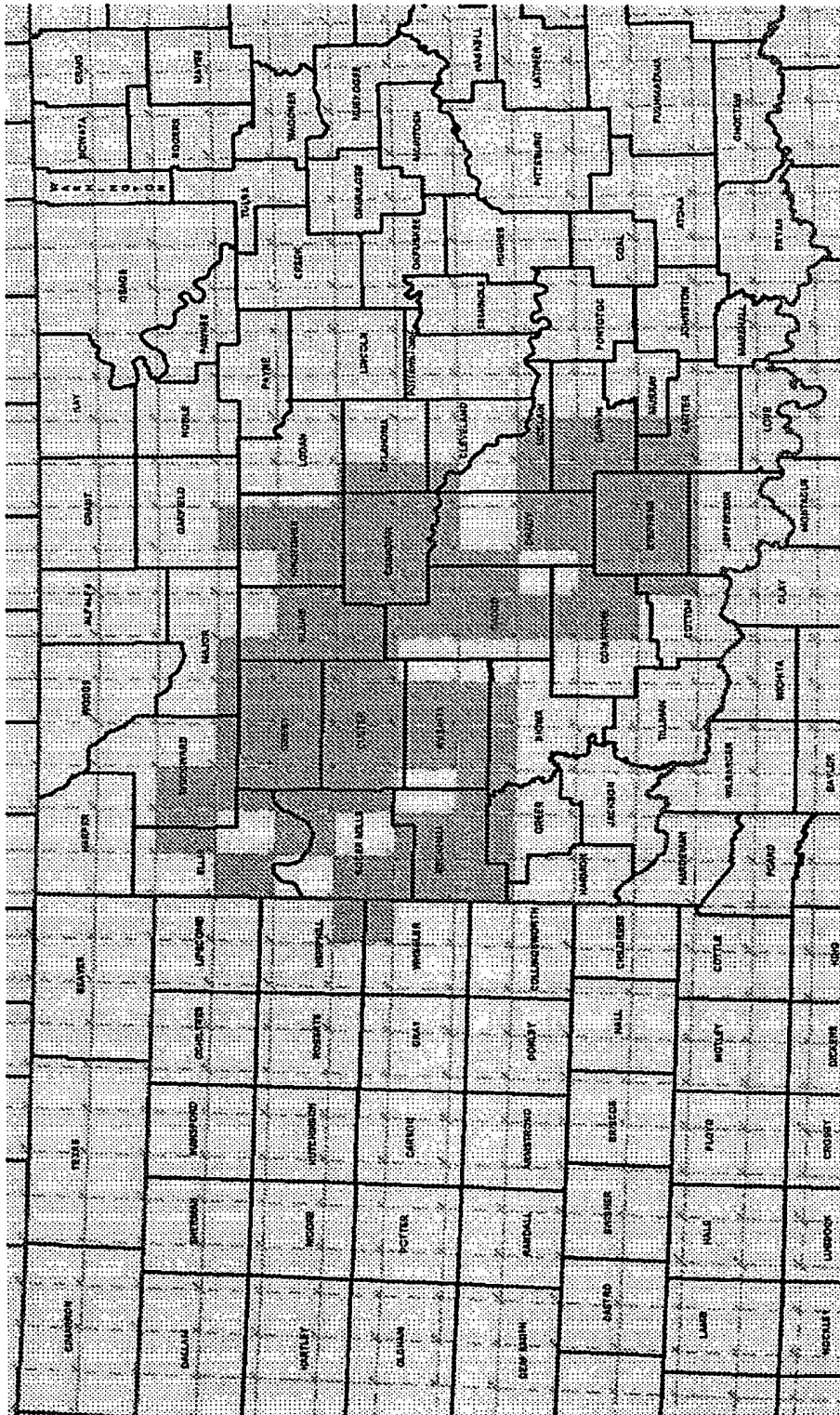FIG. 4

FIG MADE SMALLER TO, BUT FIG 2 FIG ON ONE SHEET
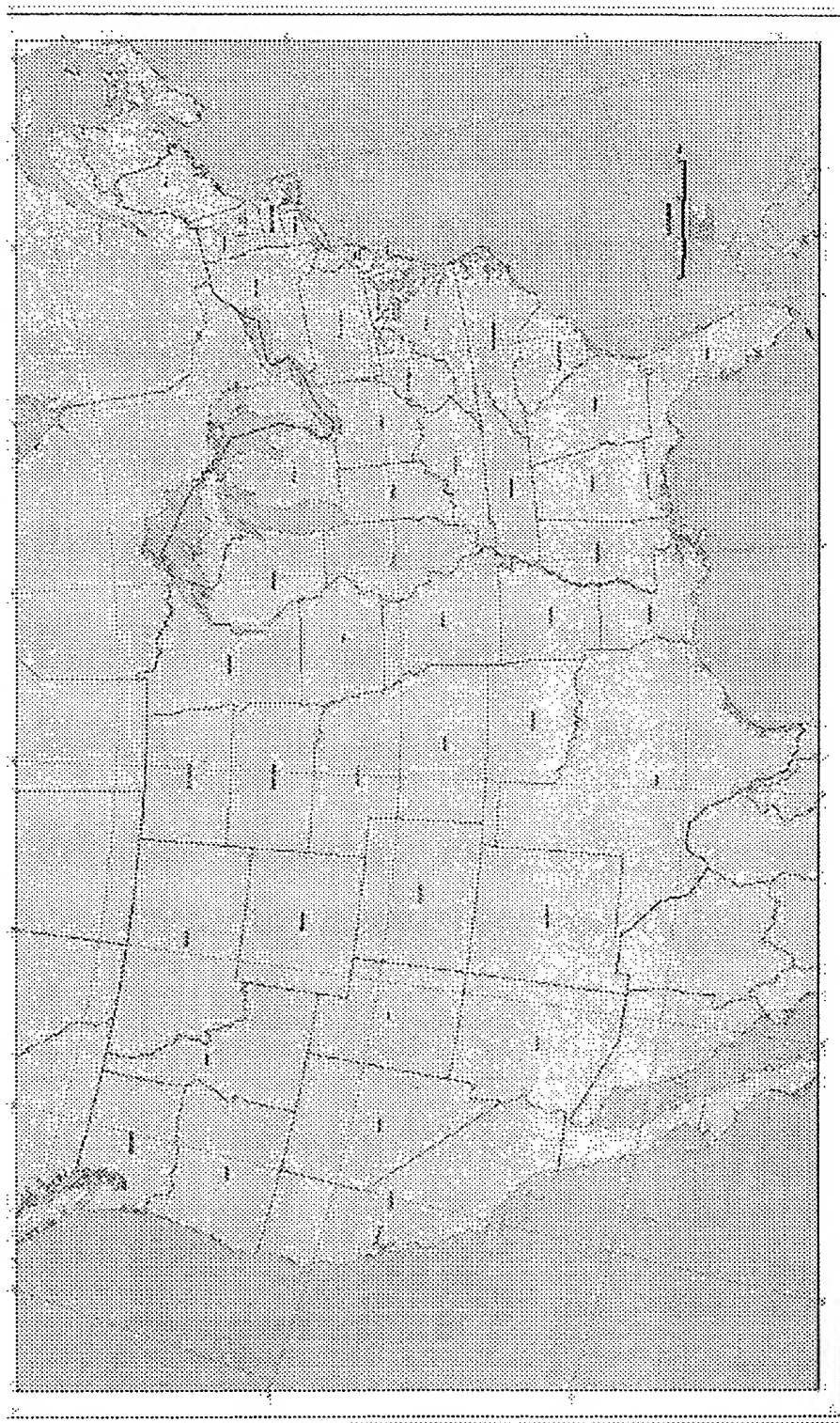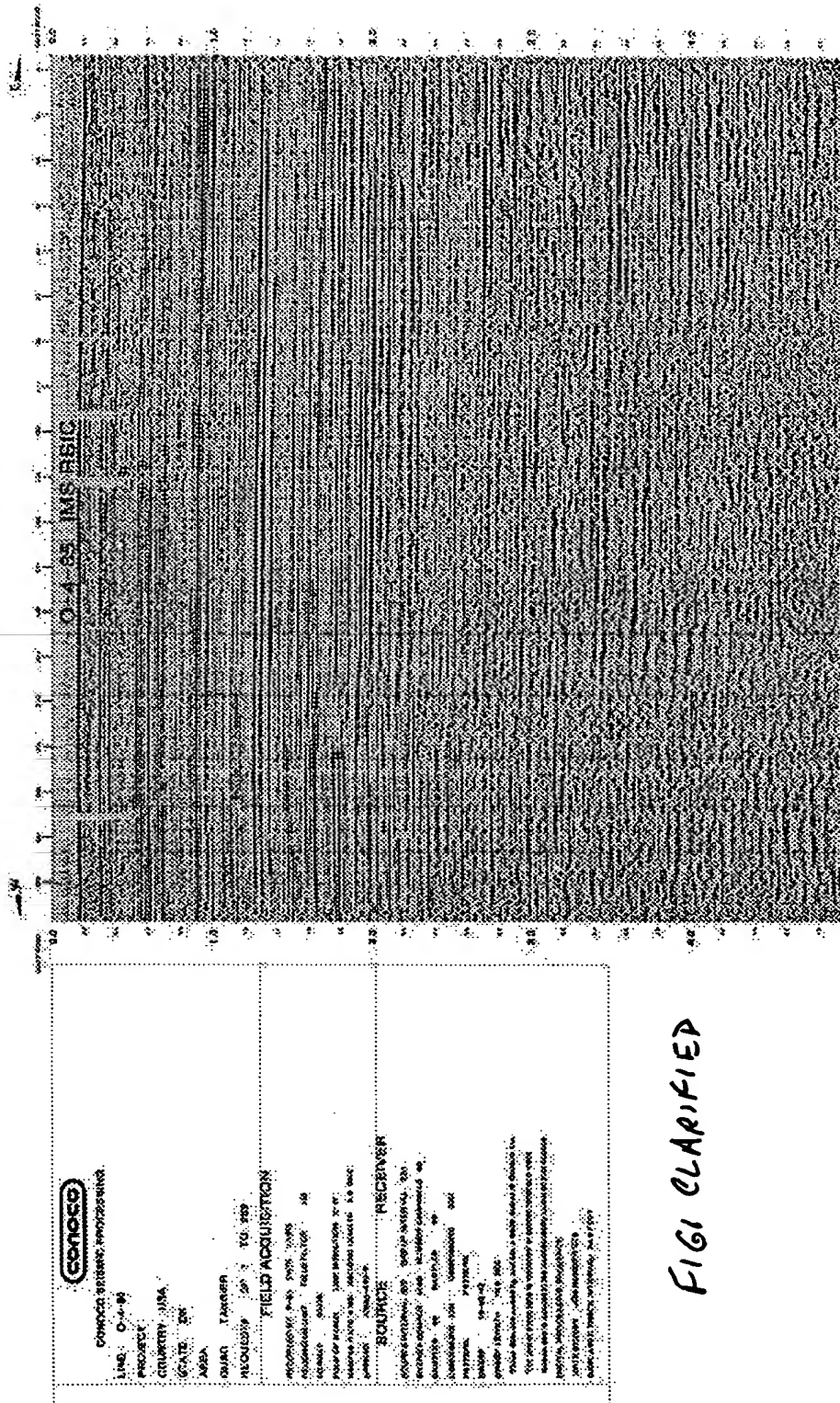
FIG CLARIFIED

FIG. 5

FIG. CLARIFIED

FIG. 6

FIG
CLARIFIED

FIG. 7

FIG. 8

FIG1 CLARIFIED